

RARE EARTH ELEMENTS & CRITICAL MINERALS

Developing critical technology, conditions, and data necessary to design, construct, and operate facilities to recover domestic rare earth elements from coal, coal refuse, clay/shale over/under burden materials, power-generation ash, and acid mine drainage.

PIONEERING TECHNOLOGIES FOR RECOVERY OF DOMESTIC RARE EARTH ELEMENTS (REES)

Development and testing of conventional and potentially transformational separation technologies at small-scale processing facilities for recovering REEs from coal and coal by-products in a **cost-effective and environmentally benign manner**

These technologies are being developed to provide a **domestic supply** of rare earth oxides, **reduce costs** and **increase efficiency** for processing, and **provide additional economic opportunities** to coal mining communities.

IMPROVING COST & ADDING VALUE TO COAL PRODUCTION

The **University of Kentucky** (UK) is testing a 1/4 ton/hr (230 kg/hr) pilot-scale plant for the extraction of REEs from Central Appalachian and Illinois Basin bituminous coal preparation plant refuse materials.



West Virginia University (WVU) is operating a bench-scale facility using approximately 150–200 g/hr (0.33–0.44 lb/hr) of solid residues generated from acid mine drainage (AMD).

ACCOMPLISHMENTS & OPERATING FACILITIES



- Using continuous solvent extraction in the laboratory, UK produced a mixed rare earth product from coal refuse. This product contained a rare earth oxide concentrate of up to 98% (equivalent to 80% on an elemental basis)—**the highest quality REE product generated to date by external participants.**
- Initiated testing at pilot-scale facility



- Produced 5% REE pre-concentrate at >90% REE recovery using AMD solids from the Northern and Central Appalachian Basins in laboratory experiments
- Testing a continuously operating bench-scale unit that will yield 3 g/hr (0.007 lb/hr) of REE concentrate (purity ≥2% by weight)

QUICK FACTS

AWARD NUMBER
DE-FE0027035 (UK)
DE-FE0026927 (WVU)

PROJECT BUDGET

UK TOTAL AWARD VALUE
\$8,820,009

WVU TOTAL AWARD VALUE
\$4,339,414

CONTACTS

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TETRA TECH



Mineral
Separation
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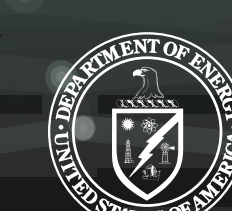


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Rockwell Automation



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